

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(pursuant to NAC 445A.236)

Permittee: Las Vegas Sands, Inc.
3355 Las Vegas Boulevard South
Las Vegas, Nevada 89109

Permit: NV0022888 – Major Modification

Location: Venetian Hotel Casino
3355 Las Vegas Boulevard South
Las Vegas, Clark County, Nevada 89109
Latitude: 36° 07' 21"N, Longitude: 115° 10' 13"W
Township 21S, Range 61E, Section 16 MDB&M

General: The Permittee has applied for a major modification of National Pollutant Discharge Elimination System (NPDES) permit NV0022888, to increase the 30-day average discharge from 0.144 million gallons per day (MGD) to 0.864 MGD. Per NAC 445A.263.6., if a permit is to be modified, only the conditions that are subject to modification may be considered or affected by the modification. This fact sheet includes all information from the most recent permit renewal and this major modification to provide a comprehensive summary of the overall project.

Treated and untreated groundwater is discharged to the Las Vegas Wash via the Clark County storm drain system and the Flamingo Wash. This permit was originally issued in February 1998 and modified to include Outfall 002, the untreated groundwater, in August 2001. NV0022888 was renewed in May 2003. The discharge of Phase I construction dewatering water was authorized under temporary permit TNEV97005. The discharge of the Palazzo - North Tower construction dewatering water is authorized under temporary permit TNEV2005388.

The Permittee operates the Venetian Hotel Casino, at 3355 Las Vegas Boulevard South in Las Vegas, Clark County, Nevada. This facility includes two permanent sub-level dewatering systems. A third permanent sub-level dewatering system is being added to the permit with this major modification to serve the North Tower.

In 1996, the Permittee's environmental consultant conducted a Phase II Environmental Assessment to investigate the extent of groundwater contamination at the site. The groundwater contamination was determined to consist of at least two plumes of dissolved-phase hydrocarbons in the gasoline range with contaminant concentrations varying across the southwest portion of the site. Contamination in soil and groundwater was limited to soils and water encountered above the caliche layer at the site. During the preconstruction subsurface investigation, no contamination source was identified on the site. Several areas of contaminated soil were discovered during construction.

The original dewatering system consists of a series of French drains that encircle the 1997 construction. This water is collected in three concrete groundwater collection sumps. The flow rate from the original dewatering system is determined from totalizing flow meters on the discharge lines from two of the sumps, one and three, and estimating the flow from the second sump. All three sumps are evacuated with two submersible pumps. The 12,000-gallon first sump is located in the hotel tower basement. This sump is evacuated to a remediation system. The second sump is located at the casino receiving dock, Outfall 003. The discharge rate from this sump is determined by the pump capacity and operating cycle. The third sump is located in the parking garage valet parking tunnel and collects stormwater, as well as groundwater, Outfall 004. The water collected in sumps two and three is discharged without treatment.

Due to the presence of volatile organic compounds (VOCs) and dissolved-phase hydrocarbons, gasoline, in the shallow groundwater recovered in the first collection sump, this water is treated in an air stripper. The water is pumped through one of three parallel 100-micron sediment filters to remove particulates. The water then travels through one of the two flow meters to the parallel aeration units. Two 300-cubic feet per minute blowers inject air at the bottom of the aeration units, facilitating volatilization of dissolved hydrocarbons and VOCs. From the aeration units, the water is pumped to a storage tank and discharged into the storm drain. The treatment system was not designed with a bypass for the water. The treatment system is powered by electricity and will shut down with no further discharge in the case of power failure. Prior to the raising of the pH permit discharge limitation, vinegar was added to the first sump to lower the pH below 7.8 standard units (SU). Currently, no chemicals are used in the water treatment system.

In 2001, the Permittee began construction of the Guggenheim Hermitage Museum on the property and encountered groundwater at 23 feet below ground surface (bgs). This required the construction of a second dewatering system. In August 2001, the NPDES permit was modified to include the discharge of untreated, museum dewatering groundwater, Outfall 002, without increasing the permitted daily maximum discharge. As-built drawings of the museum dewatering system and the revised Operations and Maintenance (O&M) Manual were approved in January 2004.

In early 2004, a new source of influent water was added to Outfall 001, the discharge from the groundwater treatment system located on the basement level of the South Tower (Phase I). The additional water originates from sumps in a power vault and an emergency power vault located near the Convention Center (Phase IIA). In 2003, low concentrations of Methyl t-butyl ether (MTBE) were detected in the water from both vaults and 1,1,2,2 Tetrachloroethane was detected in the emergency power vault. Although a 2004 water sample from a pit upgradient of the vaults was analyzed with no VOCs detected, this groundwater is processed through the air stripper system. The new source of water did not require permit modification because the groundwater is processed through the existing treatment system without an increase of the 30-day average flow limitation.

The 50-story Palazzo-North Tower will include approximately 3,025 hotel rooms, 80,000 square feet of casino, a four-story subterranean parking garage, nine roof top pools, retail shopping, and the third permanent sub-level dewatering system. This dewatering system will include four groundwater collection sumps in the North Tower parking garage. The 560-gallon GSP-1-E sump will collect uncontaminated groundwater from below the caliche layer and a portion of the garage stormwater runoff. Secant walls will be installed as structural components of the sublevel structure of the North Tower. The secant walls have been designed to limit the amount of groundwater infiltration through the walls. The infiltration rate cannot be determined at this time. The 360-gallon GSP-2-E sump has been designed to collect the secant wall seepage. The 560-gallon GSP-3-E sump will collect a portion of the structure under slab drain water. The 1,615-gallon GSP-4-E sump will collect the remainder of the subdrain water and the garage stormwater.

The GSP-2-E sump water is being treated in a temporary treatment system and will be permanently connected to the South Tower air stripper, as construction allows. Water quality data initially indicated that treatment would not be necessary for this source of groundwater. Due to the detection of MTBE in the two most recent analyses, it is suspected that a plume has been drawn to this portion of the dewatering system. The water collected in the other three North Tower concrete sumps is not expected to require treatment and will be discharged to the same storm drain inlet.

Flow: The flow into the collection sumps depends on the depth to groundwater in the Las Vegas Valley water table aquifer system and the amount of precipitation. The water table varies in depth from zero to 50 feet bgs.

In 2001 and 2002, the average Outfall 001 discharge was 0.0190 MGD and 0.0202 MGD, respectively, with a

minimum 30-day average of 0.0058 MGD in July 2001 and a maximum 30-day average of 0.0596 MGD in October 2002. During the 17-month life of Outfall 002, the average discharge has been 0.0196 MGD with a minimum 30-day average of 0.0132 MGD in June 2002 and a maximum 30-day average of 0.0288 MGD in August 2001. The maximum discharge from Outfalls 001 and 002, since Outfall 002 was added to the permit, was approximately 50% of the 0.1440 MGD discharge limitation. The Permittee has not reported discharges from the other two sumps and has not requested any change in the permitted flow.

The 30-day average flow under the temporary permit has ranged from 0.0150 MGD to 0.05281 MGD with a life of permit average of 0.04324 MGD.

The requested 30-day average flow discharge limitation, 0.864 MGD, is a conservative value based on the capacities of the dewatering systems. This value will be the sum of the discharges from up to seven outfalls.

Receiving Water Characteristics: Groundwater from these dewatering systems is discharged to the Clark County storm drain system via a drop inlet on the southeast corner of Las Vegas Boulevard and Sands Avenue. The storm drain conveys the water to the Upper Las Vegas Wash via the Flamingo Wash. The discharge point for the storm sewer at the Flamingo Wash is located near the intersection of Desert Inn Road and McLeod Drive. Water quality standards for the Upper Las Vegas Wash are specified in NAC 445A.199.

The beneficial uses of the Upper Las Vegas Wash, as designated in NAC 445A.198, are propagation of aquatic life, excluding fish; propagation of wildlife; irrigation; recreation not involving contact with water; maintenance of a freshwater marsh; and watering of livestock.

Proposed Effluent Limitations: Effluent samples taken in compliance with the monitoring requirements specified below shall be taken from:

- i. the sample port on the discharge line from the treatment system, Outfall 001;
- ii. the discharge from the Guggenheim Hermitage Museum dewatering, Outfall 002;
- iii. the discharge from the casino receiving dock sump, Outfall 003;
- iv. the discharge from the parking garage valet parking tunnel sump, Outfall 004;
- v. the manhole located on Harrah's Drive approximately 100 feet west of Koval Lane;
- vi. the discharge from the North Tower deep aquifer and parking garage stormwater sump GSP-2-E, Outfall 005;
- vii. the discharge from the North Tower secant wall drain sump GSP-2-E temporary treatment system, Outfall 006 (This outfall will be used until the Permittee has connected this sump to the treatment system of Outfall 001.);
- viii. the discharge from the North Tower subdrain sump GSP-3-E, Outfall 007; and
- ix. the discharge from the North Tower subdrain system and parking garage stormwater sump GSP-4-E, Outfall 008.

Table 1: Discharge Limitations

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	30-Day	Daily	Sample	Measurement	Sample

	Average	Maximum	Location	Frequency	Type
Flow, MGD	Monitor and Report		i., ii.	Monthly	Flow Meter
			iii., iv., vi., vii. ⁴ , viii., ix.		Calculation
	0.864	---	Σ i., ii., iii., iv., vi., vii. ⁴ , viii., ix.		Calculation
TPH EPA SW-846 Method 8015 (modified to detect “extractable fuel hydrocarbons”), mg/L	---	1.0 ²	i., vii. ⁴ , ix.	Monthly ¹	Discrete
			ii., iii., iv., vi., viii.	Quarterly	
VOC EPA Method 624 (report all parameters), µg/L	---	Monitor & Report	i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Annually ³	Discrete
Benzene	---	5 ²	i., vii. ⁴	Monthly ¹	Discrete
Toluene	---	100 ²			
Ethylbenzene	---	100 ²			
Total Xylenes	---	200 ²			
MTBE	---	20 ²			
Total Dissolved Solids, mg/L	Monitor & Report		i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Quarterly	Discrete
Total Inorganic Nitrogen - N, mg/L	---	20.0	i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Quarterly	Discrete
Total Ammonia - N, lb/day	< 1.0		Σ i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Quarterly	Calculation
pH, SU	6.5 ≤ pH ≤ 9.0		i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Quarterly	Discrete
Total Phosphorus - P, lb/day	< 1.0		Σ i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Quarterly	Calculation
Aluminum, mg/L	Monitor & Report		i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Annually ³	Discrete
Lead, mg/L	---	0.015	i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Quarterly	Discrete
Manganese, mg/L	Monitor & Report		i., ii., iii., iv., vi., vii. ⁴ , viii., ix.	Annually ³	Discrete
Presence of Sludge or Bottom Deposits	Monitor & Report		v.	Weekly	Visual

Notes:

1. After an upset, or an unscheduled shutdown due to system failure, the measurement frequency shall be once within the first 24 hours of startup with a 24-hour lab turnaround and reporting; weekly for three weeks with a 72-hour turnaround and reporting; and monthly thereafter with quarterly reporting.

2. If the discharge exceeds permit limits, the system shall be corrected and adjusted within 24 hours. The discharge shall be re-sampled within 48 hours to confirm that the system is functioning properly and meeting permit limitations.
3. To be sampled in the fourth quarter and submitted to the Division with the Annual Report.
4. Outfall 005 and the temporary treatment system will be abandoned when sump GSP-2-E is connected to the Phase I groundwater treatment system, Outfall 001.

MGD:	Million gallons per day.	-N:	As nitrogen.
TPH:	Total petroleum hydrocarbons.	SU:	Standard units.
mg/L:	Milligrams per liter.	-P:	As phosphorus.
µg/L:	Micrograms per liter.	VOC:	Volatile organic compounds.
lb/day:	Pounds per day.	MTBE:	Methyl tert-butyl ether.

Rationale for Permit Requirements: Monitoring requirements for the parameters specified in Table 1 above have been established to ensure that the receiving water, the Las Vegas Wash, is not degraded as a result of the Permittee's dewatering discharges.

Due to the high variability of the quality of the discharges, as documented by the Outfalls 001 and 002 discharge monitoring reports, monitoring of the receiving dock and valet tunnel sumps' discharges has been added to the permit. Due to concerns about the migration of additional contaminant plumes on to the Permittee's property, quarterly TPH and annual VOC characterization of all discharges has been added to the permit.

Flow: The rationale for the daily maximum discharge was explained in the Flow section of this fact sheet.

Total Petroleum Hydrocarbons (TPH): The shallow groundwater in the vicinity of the hotel tower was contaminated by at least two hydrocarbon plumes that migrated on to the site. At a detection level of 0.25 mg/L, TPH has not been detected in the Outfall 001 discharge.

TPH has not been detected in the temporary permit discharge or in the untreated groundwater. The draft permit proposes to continue to monitor TPH with a 1.0 mg/L discharge limitation.

Volatile Organic Compounds (VOC): The shallow groundwater in the immediate area of the hotel tower is impacted by plumes of hydrocarbons containing VOCs. The VOCs that have been detected in the treatment system influent are listed in Table 1: Discharge Limitations. Toluene, ethylbenzene, and xylene have been occasionally detected at levels below the daily maximums in the discharge.

The previous permit was issued before the Division adopted 20 µg/L as the action level for methyl tert-butyl ether (MTBE) in groundwater for sites in close proximity to receptors and/or sensitive environments. Therefore, there was no discharge limitation for MTBE in the previous permit. This groundwater standard is being used for all discharges to surface waters. MTBE has frequently been detected in the discharge; all detections of MTBE in the discharge, since March 1999, have been below the proposed discharge limitation.

Two VOCs, chloroform, the only trihalomethane (THM) detected, and bromomethane, have been detected in the temporary permit discharge at concentrations ranging from non-detect to 14 µg/L and non-detect to 2.4 µg/L, respectively. The THM maximum contaminant level (MCL) is 80 µg/L. There is no bromomethane MCL. These two compounds and MTBE, maximum concentration 50 µg/L, were the only VOCs identified in the untreated groundwater. The draft permit proposes to continue to monitor VOCs without change to the discharge limitations.

Total Dissolved Solids (TDS): NAC 445A.199 includes a single value at 180°C TDS standard for beneficial uses of $\leq 3,000$ mg/L. The discharge has met this standard every monitoring. The TDS concentration of the discharge has ranged from 1,160 mg/L to 2,640 mg/L with a life of permit average of 2,010 mg/L. The shallow groundwater with naturally occurring elevated TDS levels would flow to the Wash, if it was not intercepted by the dewatering system, therefore, the TDS standard is not applied to dewatering discharges in

this area.

This permit is for the interception and passage of groundwater and thus is exempted under the Colorado River Basin Salinity Control Forum's policy on groundwater interception.

The TDS concentration of the temporary permit discharge has ranged from 1,100 mg/L to 2,300 mg/L with an average concentration of 1,520 mg/L. Similar TDS concentrations were observed in the untreated groundwater. The draft permit proposes to continue to monitor TDS without discharge limitation.

Total Inorganic Nitrogen as Nitrogen (TIN): NAC 445A.199 includes a requirement to maintain existing higher quality TIN standard of 95% of the samples \leq 20.0 mg/L. The previous permit required monitoring of total nitrogen (TN), not TIN. The TN concentrations in the discharge have ranged from 0.30 mg/L to 10.0 mg/L with a 6.2 mg/L Outfall 001 life of permit average.

The TIN concentration of the temporary permit discharge has ranged from 2.9 mg/L to 6.53 mg/L with an average concentration of 4.1 mg/L. The draft permit proposes to continue to monitor TIN with a 20.0 mg/L discharge limitation.

pH: NAC 445A.199 includes a single value pH water quality standard for beneficial uses within the range of 6.5 – 9.0 SU. The permit was modified in July 2000 to raise the upper pH limit from 7.8 SU to 9.0 SU to be consistent with NAC 445A.199. The Permittee has not exceeded the current pH permit limitation in the discharge from either monitored outfall from the previous permit.

The pH of the temporary permit discharge has ranged from 6.98 SU to 7.88 SU. The draft permit proposes to continue to monitor pH without change to the discharge limitation.

Total Phosphorus as Phosphorus (TP): In 1987, a TP total maximum daily load (TMDL) of 434 lb/day was established for the Las Vegas Bay/Wash. The waste load allocations (WLAs) set are applicable for only April through September and were based on a target concentration of 0.64 mg/L. WLAs have been assigned only to the Cities of Las Vegas and Henderson and the Clark County Water Reclamation District.

Based on the State's de minimis policy of exempting discharges of less than 1 lb/day TP from the TMDL analysis, a WLA has not been assigned to this permittee. At the maximum permitted flow of 0.144 MGD and the average TP concentration of 0.30 mg/L, the Permittee would discharge 0.36 lb/day TP. The 0.64 mg/L TP target concentration was exceeded once, August 1999, with a concentration of 1.9 mg/L; due to low flow that month, the 1 lb/day de minimus loading was not exceeded.

Phosphorus was not detected in two of the temporary permit discharge analyses, but was found at a maximum concentration of 0.002 mg/L in other analyses. Higher total phosphorus concentrations were observed in the untreated groundwater with a maximum concentration of 0.28 mg/L. The draft permit proposes to continue to monitor total phosphorus with a discharge limitation of <1.0 lb/day.

Total Suspended Solids (TSS): NAC 445A.199 includes a TSS water quality standard for beneficial uses of \leq 135 mg/L. Due to the low TSS in groundwater and the infrequent inflow of stormwater to the parking garage valet parking tunnel sump, TSS monitoring of the discharge is not required by the permit.

TSS was not monitored in the temporary permit discharge. TSS monitoring is not proposed in the draft permit.

Total Ammonia as Nitrogen: A total ammonia TMDL of 970 lb/day has been established for the Las Vegas Bay/Wash. The previous permit did not require monitoring of total ammonia. Based on the low concentrations of total ammonia in groundwater and the State's de minimis policy of exempting discharges of less than 1.0

lb/day total ammonia from the TMDL analysis, the total ammonia load is not expected to be an issue.

Ammonia was not detected in the temporary permit discharge or in the untreated groundwater. The draft permit proposes to continue to monitor total ammonia with a <1.0 lb/day discharge limitation.

Aluminum: The monitoring of aluminum was added to the permit because the 2001 permit modification application listed an aluminum concentration of 0.26 mg/L in the Outfall 002 discharge. The US EPA secondary drinking water standard for aluminum is 0.05 to 0.2 mg/L.

Aluminum was not detected in two of the temporary permit discharge analyses, but was found at concentrations as high as 3.96 mg/L in other analyses. Similar aluminum concentration fluctuations were observed in the untreated groundwater with a range from 0.06 mg/L to 5.21 mg/L. The draft permit proposes to continue to monitor aluminum without discharge limitation.

Lead: The monitoring of lead was added to the permit because the 2001 permit modification application listed a lead concentration of 0.11 mg/L in the Outfall 002 discharge. The primary drinking water standard for lead is 0.015 mg/L.

Lead was not detected in three of the temporary permit discharge analyses, but was found at concentrations as high as 0.57 mg/L in other analyses. Lead was not detected in the untreated groundwater. The draft permit proposes to continue to monitor lead with a 0.015 mg/L discharge limitation.

Manganese: The monitoring of manganese was added to the permit because the October 1997 permit application listed a manganese concentration in the discharge of 0.25 mg/L. The Nevada secondary drinking water standard for manganese is 0.1 mg/L.

The manganese concentration of the temporary permit discharge has ranged from 0.01 mg/L to 0.11 mg/L with an average concentration of 0.06 mg/L. The influent manganese concentration has ranged from non-detect to 0.29 mg/L. The draft permit proposes to continue to monitor manganese without discharge limitation.

Schedule of Compliance: The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications that the Administrator may make in approving the schedule of compliance.

-Within sixty (60) days of the completion of North Tower construction, the Permittee shall submit a revised Operations and Maintenance Manual to the Division for review and approval.

-Within sixty (60) days of the completion of North Tower construction, the Permittee shall submit as-built drawings of the North Tower dewatering and discharge system to the Division for review and approval.

Proposed Determination: The Division has made the tentative determination to issue the proposed permit modification without extending the term beyond the current May 9, 2008 expiration date.

Procedures for Public Comment: The Notice of the Division's intent to issue a permit authorizing the discharge of treated water to the Las Vegas Wash, subject to the conditions contained within the permit is being sent to the **Las Vegas Review-Journal** for publication. The Notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing for a period of thirty (30) days following the date of publication of the public notice in the newspaper. The comment period can be extended at the discretion of the Administrator. The deadline date and time by which all comments are

to be submitted (via postmarked mail, time-stamped faxes, e-mails, or hand-delivered items) to the Division is 5:00 PM September 23, 2005.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted. Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by: Bruce Holmgren
Date: August 2005